To estimate the running times and hypothesize the order of growth, we first need to analyze the given data and then extrapolate to the missing values. Let's look at the running times and estimate accordingly.

Program A

- **Given data**:
  - 1,000: 0.001 second
  - 10,000: 0.012 second
  - 100,000: 0.16 second
  - 1,000,000: ? seconds

Program B

- **Given data**:
  - 1,000: 1 minute
  - 10,000: 10 minutes
  - 100,000: 1.7 hours
  - 1,000,000: ? hours

Program C

- **Given data**:
  - 1,000: 1 second
  - 10,000: 1.7 minutes
  - 100,000: 2.8 hours
  - 1,000,000: ? days

Hypotheses for the Order of Growth

Let's analyze the patterns in the running times:

Program A:

- From 1,000 to 10,000, the time increases by approximately 12 times.
- From 10,000 to 100,000, the time increases by approximately 13.33 times.
- The increases seem to be polynomial but more specifically, it appears to be roughly $O(n \log n)$.

Extrapolating to 1,000,000:

- Using the same ratio, let's assume it increases by about 10 times again (since the increase from 100,000 to 1,000,000 is also tenfold):
  - 0.16 seconds * 10 = 1.6 seconds.

Estimated running time for Program A for $n = 1,000,000$: **1.6 seconds**

Program B:

- From 1,000 to 10,000, the time increases by 10 times.
- From 10,000 to 100,000, the time increases by approximately 10.2 times (from 10 minutes to 1.7 hours).
- The pattern suggests exponential growth, likely $O(n^2)$.

Extrapolating to 1,000,000:

- From 100,000 to 1,000,000, if the time increases by roughly 10 times again:
  - 1.7 hours * 10 = 17 hours.

Estimated running time for Program B for $n = 1,000,000$: **17 hours**

Program C:

- From 1,000 to 10,000, the time increases by approximately 102 times (1 second to 1.7 minutes).
- From 10,000 to 100,000, the time increases by approximately 100 times (1.7 minutes to 2.8 hours).
- This indicates exponential growth, likely $O(n^3)$.

Extrapolating to 1,000,000:

- From 100,000 to 1,000,000, if the time increases by roughly 100 times again:
  - 2.8 hours * 100 = 280 hours, which is approximately 11.67 days.

Estimated running time for Program C for $n = 1,000,000$: **11.67 days**

Summary of Estimates:

- **Program A**: 1.6 seconds
- **Program B**: 17 hours
- **Program C**: 11.67 days

Hypotheses for the Order of Growth:

- **Program A**: $O(n \log n)$
- **Program B**: $O(n^2)$
- **Program C**: $O(n^3)$